ANALYSIS General
ENGINEER W.F. Schult
DATE 4/26/31

PAGE 1
MODEL S-5
REPORT NO. 1

DESCRIPTION

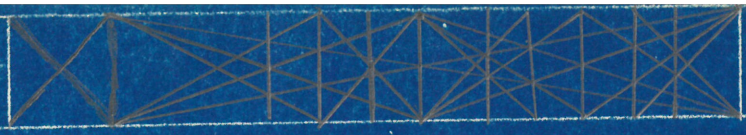
The Schult XP 800 pursuit airplane is designed to meet extreme performance with a design load of 3908 pounds and a maximum load of 4192 pounds. By using the S-2 Design, enclosed, as a basis the following information relates in general, the additions changes and features of the design submitted.

This machine is a low wing monoplane with a semi-retractable landing gear, fully retractable tail wheel, chassis wing and Fowler wing, coupled with a simplified tail unit consisting only of a rudder and elevator.

Powered with a geared Pratt & Whitney 14 cylinder Twin Wasp Radial 800 H.P. motor, a take off distance of about 734 feet is required to clear a 50 foot obstacle. One variable pitch prop. may be used but two is preferable, each rotating in the opposite direction. The later combination reduces torque to a minimum thereby eliminating wash out or wash in of the wings and excess fin area. Also to assist in quick take off and rapid initial climb a Schult retractable chassis wing of 30 square feet is installed adjacent to the wheels.

The rate of climb at sea level, with all retractable parts retracted, is in excess of 2670 feet per minute thereby it is possible to reach an altitude of 10,000 feet in about 3.9 minutes. At this altitude the maximum speed is about 284 miles per hour. Furthermore a service ceiling of about 26,000 feet is reached in about 24½ minutes.

An endurance of 3 hours @ 10,000 feet @ 225 m.p.h. is possible with a gross load of 4192 lbs. with-out the pilot's constant attention since the Hall elevator is trimmed with small trailing edge vanes.



DESCRIPTION

A landing speed of less than 65 m.p.h. is possible by the aid of a Fowler Wing in conjunction with a Schult Retractable chassis wing. The gliding angle with this combination is about 12°-30 which enables one to clear a 50 foot obstacle and land about 225 beyond on regulation wheels and shock absorbers. It is preferable to use the Schult wheel with a self contained Oleo shock absorber or better yet use Rusco rubber rings for light weight, less maintenance, excellent shock absorbing qualities and low cost. Landing run is reduced to a minimum by the use of wheel brakes operated by the control stick in conjunction with the tail wheel unit, only, when later is in contact with the ground, thereby eliminating any possibility of nosing from this source.

Stability is gained by the use of a stable M-6 wing section in conjunction with a similar elevator section. Furthermore the C.G. lies aft of the C.P. in order to maintain a stable and easily manuverable airplane with small spinning tendencies.

The main wing is conventional using two dural spars of the plate web and rivet flange angle construction with stamped dural and trussed dural ribs spaced 6" apart. The covering is Alclad serving also to take care of all drag loads. Mounted near each tip is a small metal Freize type aileron, differentially controlled by push pull tubes and bell cranks, with a maximum up motion of 35° and down motion of 0.5° from the neutral

The chassis wing an M-6 section consists of a steel tube spar with dural ribs and Alclad

DESCRIPTION

covering. It's angle is maintained either mechanically or by the aid of a trailing edge vane. The former acting also as a brace between the wheels, is retracted with the wheels by means of a connecting link and bell crank. The bell crank is rigidly connected to a torque tube, which is mounted in bearings just back of the lower flange of the front spar. This torque tube is rotated by mechanical or electrical means thus raizing or lowering the chassis wing combination.

The Fowler wing, an M-6 section, consists of a dural tubular spar and dural stamped ribs covered either with thin Alclad or cloth. It is mounted on the end of a series of arms interconneted by a torque tube located conveniently on bearings about 5" from the trailing edge of the main wing. This surface is actuated in or out by means of a long screw thread and nut. The latter mounted in the rear spar is rotated by mechanical or electrical means.*

The fuselage is conventional all welded steel tubing covered with Alclad back to station #4, The after portion being covered with cloth. Just forward of the elevator is mounted the tail wheel. This unit is swiveling and retractable. The shock absorbing medium is either Oleo or Rusco rubber rings, the latter preferred.

The rudder consists mainly of a steel tube spar and dural stamped ribs covered with Alclad.

The elevator also is built of a steel tube spar and dural ribs, covered with Alclad. Trailing edge vanes are provided to trim the machine at any particular speed.

* The angle of the Fowler is maintained either mechanically or by the aid trailing edge vanes.

DESCRIPTION

One geared Pratt & Whitney 14 cylinder, two row, radial 800 H.P. motor is used. A 150 gallons of gasolene is located in one tank just aft of the motor, separated from the latter by means of a fire wall. Nine gallons of oil are carried in a nose tank of stream line tubing which in itself forms part of the N.A.C.A. cowling. To the rear of the motor is the exhaust collector ring, which serves as the other end of the N.A.C.A. cowling. A flat piece of dural connected between these two rings completes the motor cowling.

The main equipment consists of one 50 caliber & one 30 caliber machine gun. These are mounted well forward with a sight in between. Directly beneath are carried 200 rounds of 50 caliber and 500 rounds of 30 caliber shell. The ejection chutes feed from the guns to each side. Beneath the pilot is located, ten 17 pound Mark I bombs. Doors are furnished to open automatical on release of any or all bombs. All other equipment is located conveniently about the pilot's cockpit.